

CLAIMS

1. (Currently amended) An imaging system comprising an image sensor, a memory, and a processor, wherein:
the image sensor and the memory are implemented in a single integrated circuit;
the image sensor is a digital pixel sensor configured to generate digital image [signals] data corresponding to an image of a scene for storage in the memory;
the memory is configured to store the digital image data corresponding to the image [signals];
and
the processor is configured to control operations of the imaging system in a diagnostic mode and in a normal operating mode, wherein, during the diagnostic mode, the processor analyzes the digital image data to determine if the image sensor is defective.
2. (Currently amended) The invention of claim 1, wherein:
the image sensor, the memory, and the processor are implemented as a system-on-a-chip (SOC) in [a] the single integrated circuit]; and
the image sensor is a digital pixel sensor that generates digital image signals for storage in the memory].
3. (Currently amended) The invention of claim 1, wherein the diagnostic mode enables the imaging system to be tested using a testing system, wherein:
a test controller different from the processor generates instructions for controlling test operations of the testing system;
the testing system provides a set of light stimuli for the image sensor in response to the instructions; and
the processor generates test results based on the digital image data indicating whether the image sensor is defective.
4. (Original) The invention of claim 3, wherein the test results are stored in the imaging system for access by the processor during the normal operating mode.
5. (Original) The invention of claim 3, wherein the test results identify a set of one or more defective pixels in the image sensor.
6. (Original) The invention of claim 3, wherein the imaging system is configured to use the test results during the normal operating mode to compensate for one or more defective pixels identified during the diagnostic mode.
7. (Original) The invention of claim 3, wherein the testing system is configured to test a packaged image sensor.
8. (Currently amended) A method for fabricating an imaging system comprising the steps of:
 - (a) forming an image sensor configured to generate digital image [signals] data corresponding to an image of a scene, wherein the image sensor is a digital pixel sensor;
 - (b) forming a memory configured to store the digital image data corresponding to the image [signals], wherein the image sensor and the memory are implemented in a single integrated circuit; and
 - (c) forming a processor configured to control operations of the imaging system in a diagnostic mode and in a normal operating mode, wherein, during the diagnostic mode, the processor analyzes the digital image data to determine if the image sensor is defective.

9. (Currently amended) The invention of claim 8, wherein:
the image sensor, the memory, and the processor are implemented as a system-on-a-chip (SOC)
in [a] the single integrated circuit; and
the image sensor is a digital pixel sensor that generates digital image signals for storage in the
memory].

10. (Currently amended) The invention of claim 8, wherein the diagnostic mode enables the
imaging system to be tested using a testing system, wherein:
a test controller different from the processor generates instructions for controlling test operations
of the testing system;
the testing system provides a set of light stimuli for the image sensor in response to the
instructions; and
the processor generates test results based on the digital image data indicating whether the image
sensor is defective.

11. (Original) The invention of claim 10, wherein the test results are stored in the imaging
system for access by the processor during the normal operating mode.

12. (Original) The invention of claim 10, wherein the test results identify a set of one or
more defective pixels in the image sensor.

13. (Original) The invention of claim 10, wherein the imaging system is configured to use
the test results during the normal operating mode to compensate for one or more defective pixels
identified during the diagnostic mode.

14. (Original) The invention of claim 10, wherein the testing system is configured to test a
packaged image sensor.

15. (Currently amended) An imaging system comprising an image sensor, a memory, and a
processor, wherein:

the image sensor and the memory are implemented in a single integrated circuit;
the image sensor is a digital pixel sensor configured to generate digital image [signals] data
corresponding to an image of a scene for storage in the memory;
the memory is configured to store the digital image data corresponding to the image [signals];
and

the processor is configured to control operations of the imaging system in a normal operating
mode, wherein, during the normal operating mode, the processor processes the digital image data to
compensate for one or more defective pixels in the image sensor.

16. (Currently amended) The invention of claim 15, wherein:
the image sensor, the memory, and the processor are implemented as a system-on-a-chip (SOC)
in [a] the single integrated circuit; and
the image sensor is a digital pixel sensor that generates digital image signals for storage in the
memory].

17. (Currently amended) The invention of claim 15, wherein the processor is further
configured to control operations of the imaging system in a diagnostic mode, wherein, during the
diagnostic mode, the processor analyzes the digital image data to identify the one or more defective
pixels in the image sensor.

18. (Currently amended) The invention of claim 17, wherein the diagnostic mode enables the imaging system to be tested using a testing system, wherein:

a test controller different from the processor generates instructions for controlling test operations of the testing system;

the testing system provides a set of light stimuli for the image sensor in response to the instructions; and

the processor generates test results based on the digital image data indicating whether the image sensor is defective.

19. (Original) The invention of claim 18, wherein the test results are stored in the imaging system for access by the processor during the normal operating mode.

20. (Original) The invention of claim 18, wherein the testing system is configured to test a packaged image sensor.

21. (New) The invention of claim 1, wherein, prior to operating the image sensor in the normal operating mode, no physical modifications are made to the image sensor in response to identifying one or more defective pixels in the image sensor during the diagnostic mode.

22. (New) The invention of claim 8, wherein, prior to operating the image sensor in the normal operating mode, no physical modifications are made to the image sensor in response to identifying one or more defective pixels in the image sensor during the diagnostic mode.

23. (New) The invention of claim 17, wherein, prior to operating the image sensor in the normal operating mode, no physical modifications are made to the image sensor in response to identifying the one or more defective pixels in the image sensor during the diagnostic mode.

24. (New) The invention of claim 1, wherein no diagnostic testing is performed on the image sensor to identify one or more defective pixels in the image sensor prior to assembling the image sensor into a packaged image sensor.

25. (New) The invention of claim 8, wherein no diagnostic testing is performed on the image sensor to identify one or more defective pixels in the image sensor prior to assembling the image sensor into a packaged image sensor.

26. (New) The invention of claim 15, wherein no diagnostic testing is performed on the image sensor to identify the one or more defective pixels in the image sensor prior to assembling the image sensor into a packaged image sensor.

27. (New) The invention of claim 3, wherein the testing system is adapted to test multiple instances of the imaging system simultaneously.

28. (New) The invention of claim 10, wherein the testing system is adapted to test multiple instances of the imaging system simultaneously.

29. (New) The invention of claim 18, wherein the testing system is adapted to test multiple instances of the imaging system simultaneously.

30. (New) The invention of claim 1, wherein:

the image sensor, the memory, and the processor are implemented as a system-on-a-chip (SOC) in the single integrated circuit; and

the diagnostic mode enables the imaging system to be tested using a testing system, wherein:
a test controller different from the processor generates instructions for controlling test operations of the testing system;

the testing system provides a set of light stimuli for the image sensor in response to the instructions;

the processor generates test results based on the digital image data indicating whether the image sensor is defective;

the test results are stored in the imaging system for access by the processor during the normal operating mode;

the test results identify a set of one or more defective pixels in the image sensor;

the imaging system is configured to use the test results during the normal operating mode to compensate for the one or more defective pixels identified during the diagnostic mode; and

the testing system is configured to test a packaged image sensor; and

prior to operating the image sensor in the normal operating mode, no physical modifications are made to the image sensor in response to identifying the one or more defective pixels in the image sensor during the diagnostic mode.

31. (New) The invention of claim 30, wherein:

no diagnostic testing is performed on the image sensor to identify the one or more defective pixels in the image sensor prior to assembling the image sensor into the packaged image sensor; and
the testing system is adapted to test multiple instances of the imaging system simultaneously.

32. (New) The invention of claim 8, wherein:

the image sensor, the memory, and the processor are implemented as a system-on-a-chip (SOC) in the single integrated circuit; and

the diagnostic mode enables the imaging system to be tested using a testing system, wherein:
a test controller different from the processor generates instructions for controlling test operations of the testing system;

the testing system provides a set of light stimuli for the image sensor in response to the instructions;

the processor generates test results based on the digital image data indicating whether the image sensor is defective;

the test results are stored in the imaging system for access by the processor during the normal operating mode;

the test results identify a set of one or more defective pixels in the image sensor;

the imaging system is configured to use the test results during the normal operating mode to compensate for the one or more defective pixels identified during the diagnostic mode; and

the testing system is configured to test a packaged image sensor; and

prior to operating the image sensor in the normal operating mode, no physical modifications are made to the image sensor in response to identifying the one or more defective pixels in the image sensor during the diagnostic mode.

33. (New) The invention of claim 32, wherein:

no diagnostic testing is performed on the image sensor to identify the one or more defective pixels in the image sensor prior to assembling the image sensor into the packaged image sensor; and
the testing system is adapted to test multiple instances of the imaging system simultaneously.

34. (New) The invention of claim 15, wherein:

the image sensor, the memory, and the processor are implemented as a system-on-a-chip (SOC) in the single integrated circuit;

the processor is further configured to control operations of the imaging system in a diagnostic mode, wherein, during the diagnostic mode, the processor analyzes the digital image data to identify the one or more defective pixels in the image sensor;

the diagnostic mode enables the imaging system to be tested using a testing system, wherein:

a test controller different from the processor generates instructions for controlling test operations of the testing system;

the testing system provides a set of light stimuli for the image sensor in response to the instructions;

the processor generates test results based on the digital image data indicating whether the image sensor is defective;

the test results are stored in the imaging system for access by the processor during the normal operating mode; and

the testing system is configured to test a packaged image sensor;

prior to operating the image sensor in the normal operating mode, no physical modifications are made to the image sensor in response to identifying the one or more defective pixels in the image sensor during the diagnostic mode.

35. (New) The invention of claim 34, wherein:

no diagnostic testing is performed on the image sensor to identify the one or more defective pixels in the image sensor prior to assembling the image sensor into the packaged image sensor; and

the testing system is adapted to test multiple instances of the imaging system simultaneously.